

(19)



JAPANESE PATENT OFFICE

## PATENT ABSTRACTS OF JAPAN

(11) Publication number: **57154009 A**(42) Date of publication of application: **22.09.82**

(51) Int. Cl.

**G01B 17/02**(21) Application number: **58041098**(22) Date of filing: **19.03.81**(71) Applicant: **SUMITOMO METAL IND LTD**(72) Inventor: **HONCHI MASAHIRO  
KONISHI TAKAO**(54) **MEASUREMENT OF THICKNESS OF COMPOSITE  
OBJECT COMPOSED OF ZIRCONIUM LAYER  
AND ZIRCONIUM ALLOY LAYER**possible, by comp so, to measure thickness of pure  
zirconium layer of the composite-type covered pipe,  
measurement of which has hitherto been left impossible.

(57) Abstract

COPYRIGHT: (C)1982, JPO&amp;Japio

**PURPOSE:** To make it possible to measure thickness of pure zirconium alone, by providing a composite pipe of pure zirconium and zirconium alloy with heat treatment at a temperature above recrystallizing temperature, and then, by measuring the thickness using ultrasonic waves of 10MHz and 100V500MHz.

**CONSTITUTION:** A composite-type covered pipe 1, which is composed of a zirconium alloy substrate layer 2 and a pure zirconium barrier layer 4, is provided with heat treatment at a temperature above recrystallizing temperature in order to allow formation of crystals of different grain sizes to take place. And then, when an ultrasonic wave of 10MHz is received from an inspecting device 11, an interior echo B appears on a CRT12, and at this time,  $t_2$  is corresponding to an overall thickness. Similarly, when a ultrasonic wave of 100V500MHz is received from an inspecting device 13, a reflecting echo F of an interface 3 appears, and at this time,  $t_1$  indicates thickness of the substrate 2. By conducting operation of  $(t_2 - t_1)$  using an operating machine 15, thickness of the pure zirconium barrier layer 4 is obtained. It is

